developing said neural tube defect, Down's Syndrome, or cardiovascular disease in said embryo or said fetus, wherein said polymorphism comprises

(a) a G instead of an A at position 66 relative to the first nucleotide of the start codon of MTRR,

(b) a G instead of an A at position 110 relative to the first nucleotide of the start codon of MTRR,

(c) a deletion of 4 nucleotides starting from position 1675 (nucleotides 1675-1678) relative to the first nucleotide of the start codon of MTRR, or

(d) a deletion of 3 nucleotides starting from nucleotide 1726 (nucleotides 1726-1728) relative to the first nucleotide of the start codon of MTRR.

7. (Amended) The method of claim 6 or 35, wherein said polymorphic MTRR is detected by analyzing nucleic acid from said test subject.

8. The method of claim 7, wherein said nucleic acid is genomic DNA.

9. The method of claim 7, wherein said nucleic acid is cDNA.

10. The method of claim 7, wherein said nucleic acid contains a G instead of an A at the third position of the twenty-second codon (nucleotide position 66, relative to the first nucleotide of the start codon) of MTRR.

11. The method of claim 7, said method further comprising:

a) PCR-amplifying a segment of MTRR nucleic acid using primers MSG108S (SEQ ID NO: 49) and AD292 (SEQ ID NO: 50), and

b) digesting the product of the PCR amplification reaction with the restriction enzyme *Nde* I, wherein a PCR product that is digested by *Nde* I indicates an increased risk of developing a neural tube defect in a mammalian embryo or fetus.

13. The method of claim 6, wherein said test subject is a future female parent of said embryo or said fetus.

14. The method of claim 6, wherein said test subject is said embryo or said fetus.

21. The method of claim 6 or 35, wherein said cardiovascular disease is premature coronary artery disease.

35. A method for detecting an increased risk of Down's Syndrome, hyperhomocysteinemia, cardiovascular, or cancer in a mammal, said method comprising detecting the presence of a homozygous MTRR polymorphism that indicates an increased risk of Down's Syndrome, hyperhomocysteinemia, cardiovascular, or cancer in said mammal, wherein said polymorphism comprises

(a) a G instead of an A at position 66 relative to the first nucleotide of the start codon of MTRR,

(b) a G instead of an A at position 110 relative to the first nucleotide of the start codon of MTRR,

(c) a deletion of 4 nucleotides starting from position 1675 (nucleotides 1675-1678) relative to the first nucleotide of the start codon of MTRR, or

(d) a deletion of 3 nucleotides starting from nucleotide 1726 (nucleotides 1726-1728) relative to the first nucleotide of the start codon of MTRR.

36. The method of claim 6, wherein said test subject is human.

37. The method of claim 35, wherein said mammal is human.

38. The method of claim 6, further comprising measuring the level of cobalamin in said test subject.

39. The method of claim 35, further comprising measuring the level of cobalamin in said mammal.

40. The method of claim 6, wherein said polymorphism comprises a G instead of an A at position 66 of MTRR.

41. The method of claim 35, wherein said polymorphism comprises a G instead of an A at position 66 of MTRR.